

SCA&I/SICP Combined Task Force Report

Guidelines for Educational Preparation and Staffing of Non-Physician Personnel in the Cardiac Catheterization Laboratory

Society for Cardiac Angiography and Interventions/Society of Invasive Cardiovascular Professionals SCA&I/SICP Combined Task Force Report

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¹ SCA&I/SICP Guidelines for Credentialing and Staffing of Non-Physician Personnel in the Cardiac Catheterization Laboratory was approved by the Society for Cardiac Angiography and Interventions Board of Trustees in August, 1999 and by the Society of Invasive Cardiovascular Professionals Board of Directors on February 15, 1999.

Introduction

The goal of bringing any patient to the Cardiac Catheterization Laboratory (CCL) is to make a diagnosis and, where appropriate, offer a therapeutic intervention to the patient. To ensure the delivery of optimal patient care and to provide complete and accurate diagnostic data, there exists a necessity for both the physician and the allied health professionals providing this care to be highly skilled and competent. With the advent of, and the continuing progression, of interventional procedures the diversity of skills necessary from the cardiovascular professional has become very diverse resulting in the requirement for personnel who possess both the skills and knowledge necessary to appropriately care for the cardiovascular patient. In 1991 the ACC/AHA Ad Hoc Task Force on Cardiac Catheterization¹ published Guidelines for Cardiac Catheterization and Cardiac Catheterization Laboratories², makes recommendations on physician, nursing, and non-nursing personnel. Although somewhat dated the guidelines do describe the mix of skills required by non-physician staff at that time. Several disciplines within the healthcare field offer parts of the skills necessary to meet these diverse needs, however only one credential addresses all the required elements. Several professional organizations²⁻⁴ have endorsed the RCIS credential (formerly the RCVT) as the credential that best addresses the responsibilities involved in the mastery of the multiple disciplines required in the Cardiac Catheterization Laboratory. Part of the worth of any credential is its ability to demonstrate evidence of the validity of a professional's knowledge. The meaning and value of the credential is clearly evidenced through the demonstrated abilities of the cardiovascular professional who attains the credential through an appropriate credentialing mechanism, regardless of other professional affiliations. It is important to have in place a mechanism that verifies the knowledge and competency of all personnel performing or assisting with procedures and that this mechanism is independent of private interests, and provides for the assessment of all non-physician personnel, utilizing the same testing mechanism.

² Pepine CJ Chairman. ACC/AHA Ad Hoc Task Force Report: Guidelines for cardiac catheterization and cardiac catheterization laboratories. *J Am Coll Cardiol* 1991; 18(5):1149-82. Appendix C Recommendations for Laboratory Operation; Personnel.

Recommended Guidelines for Educational Preparation and Staffing of Non-Physician Personnel in the Cardiac Catheterization Laboratory

While recognizing the multidisciplinary backgrounds of the Cardiac Catheterization Laboratory personnel, we recommend that the Registered Cardiovascular Invasive Specialist (RCIS) as awarded by Cardiovascular Credentialing International (CCI), be maintained as the minimum academic preparation for all non-physician health care personnel working in the Invasive Catheterization setting: Cardiac Cath Lab, and Pre and Post Catheterization areas.

- a. There shall be at least one Registered Cardiovascular Invasive Specialist (RCIS) assigned to the Catheterization Laboratory at all times-who shall have Basic and Advanced Cardiac Life Support experience, knowledge of the care of the Cardiovascular patient, knowledge of Cardiovascular medications and experience with Invasive Cardiovascular procedures. In pediatric cardiac catheterization laboratories, the RCIS shall also have experience in the care of the pediatric cardiac patient.
- b. There shall be departmental goals and objectives, standards of professional practice, procedure manuals and written job descriptions for each level of personnel, which shall include the following:
 1. A means for assessing the patient care needs and adequate staffing to meet those needs.
 2. Staffing patterns that are adequate to meet the departmental goals, standards of practice and the needs of the patient.
 3. An adequate number of registered and registry eligible personnel to assure those staffing levels meet the total needs of the patient.
 4. Health care facilities providing Invasive Cardiovascular services, specifically Invasive diagnostic and interventional procedures, adopt a scope of practice and standards of care consistent with current practice guidelines as set forth by the professional practice organizations.
 5. The patients preoperative and postoperative care in the Cardiac Catheterization area shall be provided by nursing staff, Registered Cardiovascular Invasive Specialists or other health care personnel with appropriate education, training and experience.
- c. The RCIS is a unified credential. For optimal diagnostic and therapeutic cardiac procedures, at least one RCIS should be participating during each case. This RCIS may be present in the scrub, hemodynamic monitoring, or circulating position. Ideally, all non-physicians employed in the Cardiac Catheterization Laboratory should hold the RCIS credential. For diagnostic or therapeutic procedures staffed by one physician, a minimum of two non-physician personnel should be present, one of whom should hold the RCIS credential. Unstable patients and/or complex therapeutic procedures, involving multiple technologies,

will require additional staff. It is important to have in place a mechanism that verifies clinical competencies of all personnel performing or assisting with procedures. Clinical competencies should be reviewed on an annual basis.

Accreditation Process

ABOUT CCI

Cardiovascular Credentialing International (CCI) is a nonprofit corporation established in September of 1988, for the sole purpose of administering credentialing examinations to cardiovascular professionals. CCI's establishment as an independent credentialing agency, occurred after the merger of the testing components of the National Society of Cardiopulmonary Technology (NSCPT), the National Alliance of Cardiovascular Technologists (NACT) and the National Board of Cardiovascular Testing (NBCVT), who first began the credentialing process as early as the 1960's.

Registry examinations are offered three times per year and include; Invasive (cardiac catheterization), Non-invasive (Echocardiography) and Vascular (Vascular Ultrasound) Technology.

Examination sites are located in the continental United States, Canada and other international locations. All examination sites are maintained by Proctors selected and used exclusively by CCI. Proctors insure that established standards for exam security and exam site location and environment meet CCI's standards for applicant testing.

The exam committee's of CCI are responsible for exam development. Exam Committee's are comprised of experts in both clinical and academic settings. Physician experts in the field of Cardiac and Vascular medicine consistently review the registry examinations for accuracy in medical content. Each committee formulates the examination based on an established percentage for each content area of examination.

CCI BOARD STRUCTURE

The Board of Trustees is comprised of societal, physician, administrative and exam representatives and an at large consumer.

Cardiovascular Credentialing International's Board of Trustees is sponsored by the following professionals organizations:

- American Society of Cardiovascular Professionals
- American College of Cardiovascular Administrators
- American Society of Echocardiography
- American College of Chest Physicians
- Surgeon Generals Office-United States Army/Air Force
- Society of Invasive Cardiovascular Professionals

Society of Vascular Technology

CCI CREDENTIALS

A two-tiered credentialing process is available through CCI for registry candidates. The RCIS credential is awarded to those applicants who successfully complete both the cardiovascular science and registry exam of their choice. The registrant is then provided with a wallet card signifying registry and specialty status.

The only way to obtain the RCIS credential is through examination by CCI. The credential of CCI may not be used by professionals until successful completion of the exam(s) and notification from CCI.

Starting in 1997 individuals are required to obtain Continuing Education Units (CEU) germane to the field to maintain their credential. Individuals not meeting the CEU requirement must retake the examination.

HOW CREDENTIALS ARE VALIDATED

The term credential is derived from the word credence and in its proper usage denotes credit to and confidence in the credential.

In the allied health fields there is no widely known single organization that evaluates the validity of credentials. College degrees accredited through the Commission on Accreditation of Allied Health Education Programs (CAAHEP) are exceptions. Therefore, the technologist and the employer must make their own evaluations based on the recognition and acceptance of credentials granted after review by professional organizations.

CCI's credentials have been acknowledged since their first offering in 1988, as the credential of the cardiovascular allied health profession. CCI's recognition by professional organizations demonstrates validity in the credentialing process. In addition, the American Council on Education (ACE) has approved CCI's Invasive, Non-invasive and Certified Cardiographic exams for college credit from 1988 to Present.

Educational Programs

History

In December 1981, the Accreditation Council for Continuing Medical education of the American Medical Association officially recognized cardiovascular technology as an allied health profession. Subsequently, organizations that had indicated an interest in sponsoring accreditation activities for the cardiovascular technologist were invited to

appoint a representative to an ad hoc committee to develop Essentials. Interested individuals were also invited to join the committee.

The ad hoc committee on development of Standards for the cardiovascular technologist held its first meeting on April 29, 1982, in Atlanta, Georgia. An initial draft of the proposed standards of an Accredited Educational Program in Cardiovascular Technology was developed as a result of this meeting. Subsequent meetings were held to refine and polish the standards. In September 1983, the committee members reached agreement on the Essentials. The Joint Review Committee on Education in Cardiovascular Technology (JRC-CVT) held its first meeting in November 1985 in preparation for its ongoing review of programs seeking accreditation in cardiovascular technology.

The following organizations initially adopted the Standards and agreed to sponsor the JRC-CVT: American College of Cardiology, American College of Chest Physicians, American College of Radiology, American Institute of Ultrasound in Medicine, American Society of Echocardiography, Alliance for Cardiovascular Professionals, and Society of Vascular Technology (formerly the Society of Noninvasive Vascular Technology). Subsequently, the American Institute of Ultrasound in Medicine withdrew as a sponsor and the Society of Invasive Cardiovascular Professionals agreed to sponsor the JRC-CVT.

Educational Programs

Length. Programs may be from 1 to 4 years in length, depending on student qualifications and number of diagnostic areas of concentration selected: invasive cardiology, noninvasive cardiology or peripheral vascular study.

Prerequisites. Students must have a high school diploma or equivalent. Many students have some college or qualifications in clinically related allied health professions.

Curricula. Curricula of accredited programs include both didactic instruction and formal laboratory experiences. Suggested areas of instruction in the core curriculum include an introduction to the field of cardiovascular technology, general and/or applied sciences, human anatomy and physiology, basic pharmacology and basic medical electronics and medical instrumentation. Emphasis, following the core curriculum, is given in the areas(s) of diagnostic evaluation selected: invasive cardiology, noninvasive cardiology and peripheral vascular study. Both didactic instruction and clinical experiences are provided in these areas.

First National Model for an Invasive Cardiovascular Technology Curriculum Project

This curriculum is proposed as a national model to be used when new Cardiovascular Technology schools are developed. Cardiovascular Technology schools educate in three specialty areas: Invasive, Noninvasive and Peripheral Vascular Technology. Most schools have a 1year "core" of science and health related classes that all the students take. They then divide the students into the specialty tracks lasting approximately 1 year each. Curriculum outlines have been developed for cardiac catheterization:

- Core (General Education Core and Health Core)
- Invasive CV Technology (Cardiac Catheterization)

This proposed national CVT curriculum is the preliminary outline developed by a consensus of CVT educators. The major outline was developed by a group of 14 CVT educators during the Alliance of Cardiovascular Professionals meeting (ACP) in Atlanta 3/28/98. Specialty committees continued work on the outlines during spring 1998. These outlines draw on the many years of experience of educators from CVT schools all over the country. Also referenced (comparative matrix) were the curricula of all approved CVT schools, JRCCVT essentials, CCI national exam outlines, and other outlines.

- Proposed National Invasive CVT Curriculum is described in Appendix A

Standards. The Standards are minimum educational standards adopted by the several collaborating organizations and the Commission on Accreditation of Allied Health Education (CAAHEP). Each new program is assessed in accordance with the Standards, and accredited programs are periodically reviewed to determine continuing substantial compliance. The Standards are available, on written request, from the Joint Review Committee on Education in Cardiovascular Technology.

Accredited Programs

- Accredited Programs are listed in Appendix B

Conclusion

The support and adoption of a unified credential allows laboratory managers to more appropriately staff cases, identifies individuals with greater expertise in the field and protects and assists the public in understanding the quality of care provided. The existence of the credential (RCIS), the Credentialing body, Professional Societies, Educational Programs, Standards of Care, and the Scope of Practice are all prerequisites to commencing the licensing process.⁶⁻⁸ These items are a prerequisite in pursuing laboratory credentialing and necessary for reimbursement issues.⁹ Although the credential does not imply competence, it does indicate that an individual has passed an examination and that validation of the

educational process has occurred. Physicians can be assured that the credentialed cardiovascular professional assisting with the care of the patient has demonstrated that they possess the required knowledge to assist in performance of cardiovascular diagnostic and therapeutic examinations, deriving both accurate data and adhering to standard protocols, in the safest manner possible.

Appendix A

Proposed National CVT Curriculum

Project Members: Dave Andreasen, RCIS Randy Christian, MS, RCVT William L. Fisher, RCIS
Andrea Helzner, MS, RCVT Kathy Moriarty, MS, RT(R)(CV), RCIS Wes Todd, BS, RCVT

PROPOSED NATIONAL MODEL CARDIOVASCULAR CURRICULUM for INVASIVE CARDIOVASCULAR SPECIALTY TRACK (Cardiac Catheterization)

- I. Invasive Cardiac Methodologies
 - A. Pioneers
 - B. Patient Prep/Pre-cath teaching/Assessment
 - C. Technologist's Role
 - D. Medical Ethics
 - E. Equipment and Tools utilized
 - F. Disposable and non-disposable
 - 1. Needles, sheaths, guide wires, catheters, manifolds, transducers, power injector, etc.
 - G. Post Cath teaching
 - H. Hemostasis
- II. Aseptic/Sterile Technique
 - A. Pathogens
 - 1. blood-born, bacteria, HIV, TB, Hepatitis
 - B. Sepsis/Asepsis
 - C. OSHA Regulations
 - D. Hand washing
 - E. PPE Personal Protective Equipment
 - F. Gowning and Gloving open & closed techniques
 - G. Sterile field/tray set up
 - H. Methods of Sterilization and disinfection
 - I. Contamination-Maintaining the sterile field
 - J. Tear down
 - K. Latex allergy
- III. Physical Principles of Radiation
 - A. X-ray tube components and imaging chain
 - 1. X-ray production/physics
 - 2. Biological effect of radiation
 - 3. Radiation safety/protection
 - 4. Film processing
 - 5. Quality Assurance
 - 6. Digital imaging
- IV. Invasive Imaging
 - A. Patient positioning
 - B. Manipulation and positioning of x-ray equipment
 - C. Contrast media
 - D. Angiography - standard techniques and projections
 - E. Injection techniques
 - F. Injection Sites
 - G. Left Ventriculography

- H. Coronary Arteriography
 - I. Aortography
 - J. Peripheral Arteriography
 - K. Pulmonary Angiography
 - L. Implantable Devices
 - M. IVUS- Intravascular ultrasound
- V. Assessment and Care of the Cardiovascular Patient
- A. Basic Assessment Techniques
 - B. History & Physical Examination
 - C. Vital Signs
 - D. Central Nervous System Assessment
 - E. Cardiovascular Assessment
 - 1. Auscultation, Murmurs, etc
 - F. Peripheral Vascular Assessment
 - 1. Pulses
 - G. Interpretation of Laboratory Studies
 - 1. Chemistries, Cardiac Enzymes, Troponin
 - 2. Fluids & Electrolytes
 - 3. Hematology & Coagulation Studies
 - 4. Arterial Blood Gas Determination
 - H. IV Therapy
 - 1. IV insertion
 - 2. IV assessment and maintenance
 - 3. Troubleshooting
 - I. Patient transport and transfer
 - J. High risk patient assessment
- VI. Treatments for complications and Emergencies
- A. Acute MI
 - B. Chest Pain
 - C. Shortness of Breath
 - D. Shock-all types
 - E. Dysrhythmias
 - F. Tamponade
 - G. Aneurysms
 - H. Dissections-Coronary-Aortic
 - I. Cerebrovascular Accident-CVA
 - J. Pulmonary Edema
 - K. Pulmonary Embolism
 - L. Acute Pulmonary Hemorrhage
 - M. Airway management /Oxygen delivery devices
 - N. ACLS Protocols
- VII. Diagnostic Procedures
- A. Indications & Contraindications
 - B. Risks &Complications
 - C. Preparation and Premedication
 - D. Terminology
 - E. Protocols
 - F. Adult and Pediatric Catheterization Techniques
 - G. Arterial lines
 - H. Percutaneous method

- I. Cut down method
- J. Position of Catheters in the Heart
- K. Right Heart Catheterization
- L. Left Heart Catheterization
- M. Angiography
- N. Hemodynamic and ECG Monitoring
- O. Blood Sampling
- P. Endomyocardial Biopsy
- Q. Electrophysiology
- R. Electrical Dynamics
- S. Hemostasis
- T. Provocations
- U. Evaluation of Data

VIII. Hemodynamic evaluation

- A. Flow dynamics-cardiac cycle
- B. Quality Control-QC
- C. Pressures
 - 1. Normal and Abnormal Pressures- Waveforms, Pressure Values, etc.
 - 2. Time-Pressure Relationships
 - 3. Pullback Identification
 - 4. Valvular Stenosis
 - 5. Valvular Insufficiencies
 - 6. Other Gradients
 - 7. Constrictive Pressures
 - 8. Restrictive Pressures
 - 9. Heart Failure Pressures
 - 10. Provocative Maneuvers
 - 11. Pressure Analysis
- D. Cardiac Output Determinations
 - 1. Fick
 - 2. Angiographic
 - 3. Thermodilution
 - 4. Comparison of Various Output Methods
 - 5. Shunts
 - 6. Regurgitant Fraction
- E. Hemodynamic Calculations
 - 1. Pressures
 - 2. Cardiac output-Cardiac Indices
 - 3. Systemic and pulmonary vascular resistance
 - 4. Systemic and pulmonary blood flow
 - 5. Shunts
 - 6. Regurgitant fraction
 - 7. Ejection fraction
 - 8. Valve areas
 - 9. Evaluation of calculated values

IX. Pharmacology

- A. Medical & Legal Aspects, Documentation
- B. Sympathetic/Parasympathetic Nervous Systems
- C. Indications, Contraindications, Mechanism of action, Normal Dosages, Side Effects, Patient Care Considerations

- D. Drug Calculations
- E. Pharmacokinetics and Pharmacodynamics of :
 1. Vasopressor and Vasodilators
 2. Diuretics
 3. Antihypertensives
 4. Local Anesthetics
 5. Anticoagulants
 6. Thrombolytics
 7. Nitrates
 8. Dysrhythmics
 9. Antianginal
 10. Calcium Channel Blockers
 11. Contrast Media
 12. Cardiac Glycosides
 13. Analgesics
 14. Sedatives
 15. Insulin Therapy
 16. Steroids
 17. ACE Inhibitors
 18. Antiemetics
 19. Antibiotics
 20. Antihistamines
 21. Oxygen
 22. Beta Blockers
 23. Antiplatelet Agents
 24. ACLS 1st and 2nd line
 25. Conscious sedation
 26. Routes of Administration

X. Cardiac Pathophysiology:
Etiology, pathophysiology, clinical manifestations and treatments
of:

- A. Coronary Artery Disease Atherosclerosis
- B. Angina
 1. stable, unstable & variant
- C. Myocardial Infarction
- D. Heart Failure
- E. Shock
- F. Valvular Heart Disease
- G. Artificial valves and surgery
- H. Cardiomyopathies
- I. Pericardial Diseases
- J. Systemic and Pulmonary Hypertension
- K. Hereditary Diseases
- L. Pulmonary Diseases
- M. Arterial Diseases
- N. Infectious Diseases
- O. Tumors
- P. Cerebrovascular Diseases
- Q. Congenital Anomalies
 1. Fetal embryology/circulation/transition
 2. Common anomalies

3. Palliative and Corrective Surgical Interventions
4. Catheter Interventions

XI. Interventional Procedures

- A. Intra-Aortic Counter Pulsation
- B. Pacemakers Temporary and Permanent
- C. Implantable Cardioverter Defibrillators-ICD's
- D. Defibrillation and Cardioversion
- E. Percutaneous Transluminal Coronary Angioplasty
- F. Atherectomy
- G. Stents
- H. Laser
- I. Thrombolytic Therapy
- J. Antiplatelet Agents
- K. Valvoplasty
- L. Pericardiocentesis
- M. Radiofrequency Ablation-RFA
- N. Cardiopulmonary Support-CPS
- O. Investigational Therapies

XII. Surgical Procedures

- A. Coronary Bypass
- B. Minimally Invasive Coronary Bypass
- C. Valvular Repair
- D. Heart Transplant
- E. Left Ventricular Assist Device
- F. Investigational Procedures

XIII. Invasive Clinical Skill Competencies-1,000 hours of clinical exposure with documented competencies in:

- A. Pre and Post Cath patient care
- B. Monitoring-Recording
- C. Manipulation of imaging equipment
- D. Film processing & Quality Control
- E. Scrubbing
- F. Circulating

Committee Chair: Jeff Davis, RRT, RCVT,
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Appendix B

JOINT REVIEW COMMITTEE ON EDUCATION IN CARDIOVASCULAR TECHNOLOGY

ACCREDITED PROGRAMS

(As of August 25, 1998)

The Joint Review Committee on Education in Cardiovascular Technology (JRC-CVT) accredits programs for cardiovascular technology. As of this date, there are seventeen programs of cardiovascular technology, which have been accredited by the American Medical Association. These programs are:

CUYAHOGA COMMUNITY COLLEGE

CARDIOVASCULAR TECHNOLOGY PROGRAM (Noninvasive) 2000

Point of Contact:

B. Edward Stacey, MA, ACSM

11000 Pleasant Valley Road

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Parma, OH 44130-5199

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EDISON COMMUNITY COLLEGE

CARDIOVASCULAR TECHNOLOGY PROGRAM (Invasive, Noninvasive) 2000

Point of Contact:

Robert J. Davis (Jeff), RRT, RCVT 8099 College Parkway, SW

Program Director

PO Box 60210

(941) 489-9430

Fort Myers, FL 33919

FAX (941) 489-9037

EL CENTRO COLLEGE

INVASIVE CARDIOVASCULAR PROGRAM (Invasive) 2000

Point of Contact:

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Program Director

Main & Lamar

(214) 860-2314

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E-Mail LRC5527@DCCCD.edu

GESSINGER MEDICAL CENTER (Invasive) 2000

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(717) 271-8002

Danville, PA 17822-2011

(516) 256-2242
FAX (516) 255-3270

MORRISTOWN MEMORIAL HOSPITAL SCHOOL OF CARDIOVASCULAR TECHNOLOGY (Invasive, Noninvasive, Vascular) 2002

Point of Contact:

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(201) 971-7529
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100 Madison Avenue
Morristown, NJ 07962-1956

**NAVAL SCHOOL OF HEALTH SCIENCES-MD
CARDIOVASCULAR TECHNICIAN SCHOOL (Invasive, Noninvasive) 2000**

Point of Contact:

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(301) 319-4759
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8901 Wisconsin Ave.
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**NORTHWEST TECHNICAL COLLEGE - EAST GRAND FORKS
CARDIOVASCULAR TECHNOLOGY PROGRAM (Invasive) 2001**

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2022 Central Ave., N.E.
East Grand Forks, MN 56721

**SENTARA NORFOLK GENERAL HOSPITAL
CARDIOVASCULAR TECHNOLOGY PROGRAM (Invasive, Noninvasive,
Vascular) 2002**

Point of Contact:

Kathy Butterbaugh,
Director
(757) 668-2900
FAX (757) 668-2905

600 Gresham Drive
Norfolk, VA 23507

SOUTHEAST TECHNICAL INSTITUTE CARDIOVASCULAR TECHNOLOGY PROGRAM (Invasive, Noninvasive, Vascular) 2000

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**SPOKANE COMMUNITY COLLEGE
CARDIOVASCULAR TECHNOLOGY PROGRAM (Invasive, Noninvasive) 2002**

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CARDIOVASCULAR TECHNOLOGY PROGRAM (Noninvasive) 1998**

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January 24, 2006

To Members of the Society for Cardiac Angiography and Interventions/Society of Invasive Cardiovascular Professionals SCA&I/SICP Combined Task Force.

At the SCA&I Montreal Meeting of the Cardiovascular Laboratory Technologist Standards Committee and at Management retreat in New Orleans we were tasked with developing a statement endorsing the Registered Invasive Cardiovascular Specialist credential (RCIS/RCVT). With this mandate, we formed the task force. This has grown into a slightly more complex document that covers credentialing for non-physician staff, the accreditation process for educational programs, and staffing guidelines for non-physician staff.

Please review the statement, make suggestions/changes that you feel may be helpful. The goal is to have the statement endorsed by the Board of Trustees of the SCA&I, the ACC's Allied Health Professionals Committee and the Board of Directors of SICP. The document should then be submitted for publication in either: Cath and CV Diagnosis, JACC or CLD. Please review the statement that goal in mind.

The goal is to have this out of the committee and to the board of trustees by the next annual meeting of the SCA&I. Thank you for your prompt review and comments.

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